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Changes to the CERESlib Metadata Subroutine

Ed Kizer (e.a.kizer@larc.nasa.gov)

1. Purpose

The Clouds and the Earth's Radiant Energy System (CERES) is processing data from several satellites containing one or more instruments. The initial creation of the metadata subroutines was designed to provide the necessary metadata for the first satellite, TRMM. After the second CERES satellite, Terra, was launched, these subroutines were not able to handle the automatic setting of all mandatory metadata for the combinations of satellites, instruments, and sensors. To further complicate matters, a third CERES satellite, Aqua, will be launched in the near future.

2. Introduction

There are several metadata values that are required when processing CERES data. Three of these metadata parameters are the values for the Satellite, Instrument, and Sensor. The TRMM satellite has only one instrument, PFM. With the addition of the Terra satellite launch two instruments, FM1 and FM2, have been added to the list of possible choices. When the Aqua satellite is launched, two more instruments, FM3 and FM4, will be added the list of instruments. The metadata subroutine must now be rewritten to use the knowledge from the Satellite and Instrument parameters to properly address the required metadata values.

3. CERES Metadata

The general processing of CERES data involves the use of three sensors, which are unique to the CERES instruments: "Total Detector," "Window Detector," and "Shortwave Detector." This data must be stored in a structured array with the associated satellite and instrument. There are two ways to achieve this task. The first is to make the required information available so that the metadata subroutine in CERESlib can make the appropriate assignments for the subsystem. The second is for the subsystem to make these assignments internal to the subsystem software and supply this information to the CERESlib metadata subroutine.

1. Set by CERESlib

The metadata subroutine need only know the information about the satellite (platform) and instrument. In order to make this happen, the following lines of code should be included in the Process Control File, PCF, used by the subsystem.

```
504|Platform|"satellite_name" or 504|Satellite|"satellite_name"  
505|Instrument|"instrument_name"
```

The first part of each line is the Logical Identifier, LID. This number is not used by the metadata subroutine, therefore, any unique number may be used. The second part of each line is very crucial and must appear exactly as written here. The third part is set by the subsystem at

run-time. At present time, the options available for Satellite (or Platform) are: “CERES,” “TRMM,” “Terra,” and “Aqua.” If “TRMM” is used for Platform, a check on Instrument will be performed to insure the first three characters are “PFM.” Checks will also be performed on the “Terra” and “Aqua” satellites to insure the first two characters of Instrument are “FM.”

CERES Instruments: For the CERES satellites and instruments the three values of the sensor parameters will be automatically set.

Non-CERES Instruments: For subsystems processing with other than CERES instruments, an additional parameter, “Imager” or “Sensor,” can be set in the PCF. In order to make this happen, one of the lines below should be included in the PCF file used by the subsystem.

```
506|Sensor|"sensor_name"  
or  
506|Imager|"imager_name"
```

As with the Platform and Instrument, the second component of each line is very crucial and must appear exactly as written here.

2. Set by Subsystem

The subsystem has the ability to assign these values within the software code. The following is an example of the assignments and the call to the ‘WriteMeta’ metadata subroutine. The index value, *n*, represents the number of specific attributes set by the subsystem code.

```
GranFile_Attr = meta_NULL  
...  
GranFile_Attr(n+1)%Name   = "AssociatedPlatformShortName.1"  
GranFile_Attr(n+1)%StringVal = "Terra"  
GranFile_Attr(n+2)%Name   = "AssociatedInstrumentShortName.1"  
GranFile_Attr(n+2)%StringVal = "FM1"  
GranFile_Attr(n+3)%Name   = "AssociatedSensorShortName.1"  
GranFile_Attr(n+3)%StringVal = "Total Detector"  
  
GranFile_Attr(n+4)%Name   = "AssociatedPlatformShortName.2"  
GranFile_Attr(n+4)%StringVal = "Terra"  
GranFile_Attr(n+5)%Name   = "AssociatedInstrumentShortName.2"  
GranFile_Attr(n+5)%StringVal = "FM1"  
GranFile_Attr(n+6)%Name   = "AssociatedSensorShortName.2"  
GranFile_Attr(n+6)%StringVal = "Window Detector"  
  
GranFile_Attr(n+7)%Name   = "AssociatedPlatformShortName.3"  
GranFile_Attr(n+7)%StringVal = "Terra"  
GranFile_Attr(n+8)%Name   = "AssociatedInstrumentShortName.3"  
GranFile_Attr(n+8)%StringVal = "FM1"  
GranFile_Attr(n+9)%Name   = "AssociatedSensorShortName.3"  
GranFile_Attr(n+9)%StringVal = "Shortwave Detector"
```

call WriteMeta(. . . , SpecificAttr=GranFile_Attr, . . .)

3. Example CERES Metadata

The following is an example of this parameter group contained in a metadata file for a CERES Instrument.

```
GROUP                = ASSOCIATEDPLATFORMINSTRUMENTSENSOR

OBJECT               = ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER
CLASS                = "1"

OBJECT               = ASSOCIATEDPLATFORMSHORTNAME
CLASS                = "1"
NUM_VAL              = 1
VALUE                = "Terra"
END_OBJECT           = ASSOCIATEDPLATFORMSHORTNAME

OBJECT               = ASSOCIATEDINSTRUMENTSHORTNAME
CLASS                = "1"
NUM_VAL              = 1
VALUE                = "FM1"
END_OBJECT           = ASSOCIATEDINSTRUMENTSHORTNAME

OBJECT               = ASSOCIATEDSENSORSHORTNAME
CLASS                = "1"
NUM_VAL              = 1
VALUE                = "Total Detector"
END_OBJECT           = ASSOCIATEDSENSORSHORTNAME

END_OBJECT           = ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER

OBJECT               = ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER
CLASS                = "2"

OBJECT               = ASSOCIATEDPLATFORMSHORTNAME
CLASS                = "2"
NUM_VAL              = 1
VALUE                = "Terra"
END_OBJECT           = ASSOCIATEDPLATFORMSHORTNAME

OBJECT               = ASSOCIATEDINSTRUMENTSHORTNAME
CLASS                = "2"
NUM_VAL              = 1
VALUE                = "FM1"
END_OBJECT           = ASSOCIATEDINSTRUMENTSHORTNAME

OBJECT               = ASSOCIATEDSENSORSHORTNAME
CLASS                = "2"
NUM_VAL              = 1
VALUE                = "Window Detector"
END_OBJECT           = ASSOCIATEDSENSORSHORTNAME
```

```

END_OBJECT      = ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER

OBJECT
CLASS           = ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER
               = "3"

OBJECT
CLASS           = ASSOCIATEDPLATFORMSHORTNAME
               = "3"
NUM_VAL         = 1
VALUE           = "Terra"
END_OBJECT      = ASSOCIATEDPLATFORMSHORTNAME

OBJECT
CLASS           = ASSOCIATEDINSTRUMENTSHORTNAME
               = "3"
NUM_VAL         = 1
VALUE           = "FM1"
END_OBJECT      = ASSOCIATEDINSTRUMENTSHORTNAME

OBJECT
CLASS           = ASSOCIATEDSENSORSHORTNAME
               = "3"
NUM_VAL         = 1
VALUE           = "ShortWave Detector"
END_OBJECT      = ASSOCIATEDSENSORSHORTNAME

END_OBJECT      = ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER

END_GROUP       = ASSOCIATEDPLATFORMINSTRUMENTSENSOR

```